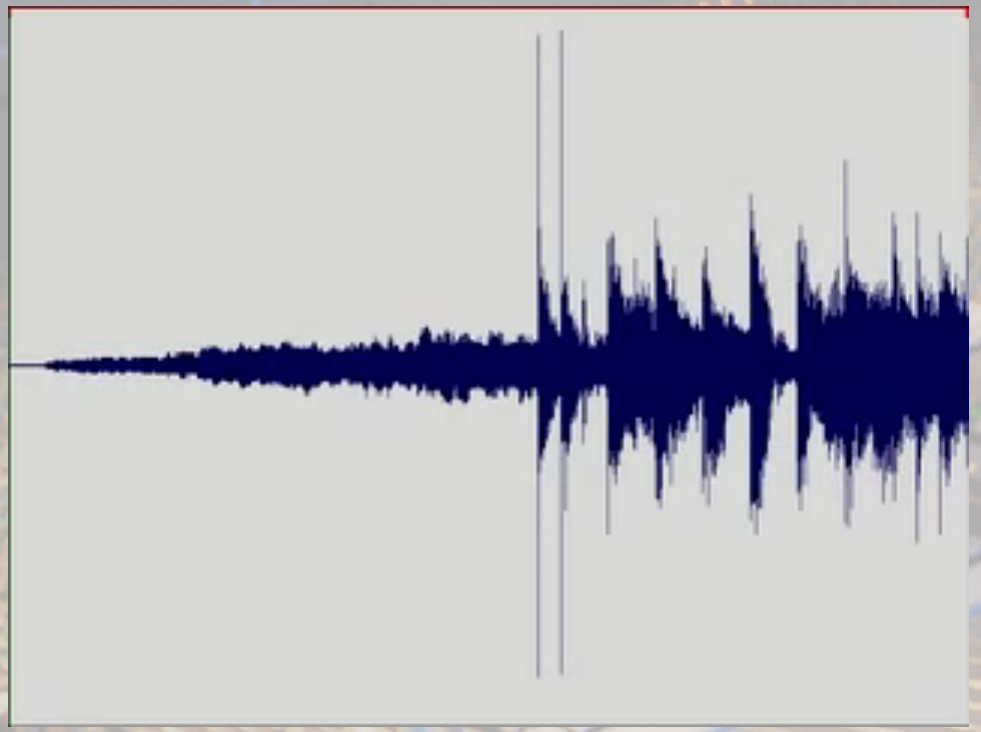
4. Dynamic Range Processing

Some points to think about:

- **What** are ‘the loudness wars’?
- What is the **effect** on music?
- **Why** is it happening?



What **processor** is involved in this?

4. Dynamic Range Processing

Objectives

- Identify and discuss the **function of dynamic range processors**
- Discuss the **parameters commonly found** on dynamic range processors
- Describe and aurally identify some of the **ways dynamic range processing is used creatively**

Skills Development

- Numeracy (interpreting data)

Key Words

Dynamic Range
Compression
Threshold
Ratio
Make Up Gain
Attack
Release
Peak
RMS
Knee
Limiter
Overcompression
Sidechain
Noise Gate

4. Dynamic Range Processing

- The difference **between the loudest and quietest parts of a track**, song or part is known as the **dynamic range.**
- It is very important in Music Technology to be able to **control the dynamic range.**
- There are **two key processes** to know about, and a couple of extra ones that are useful to us.

4. Dynamic Range Processing

Compression

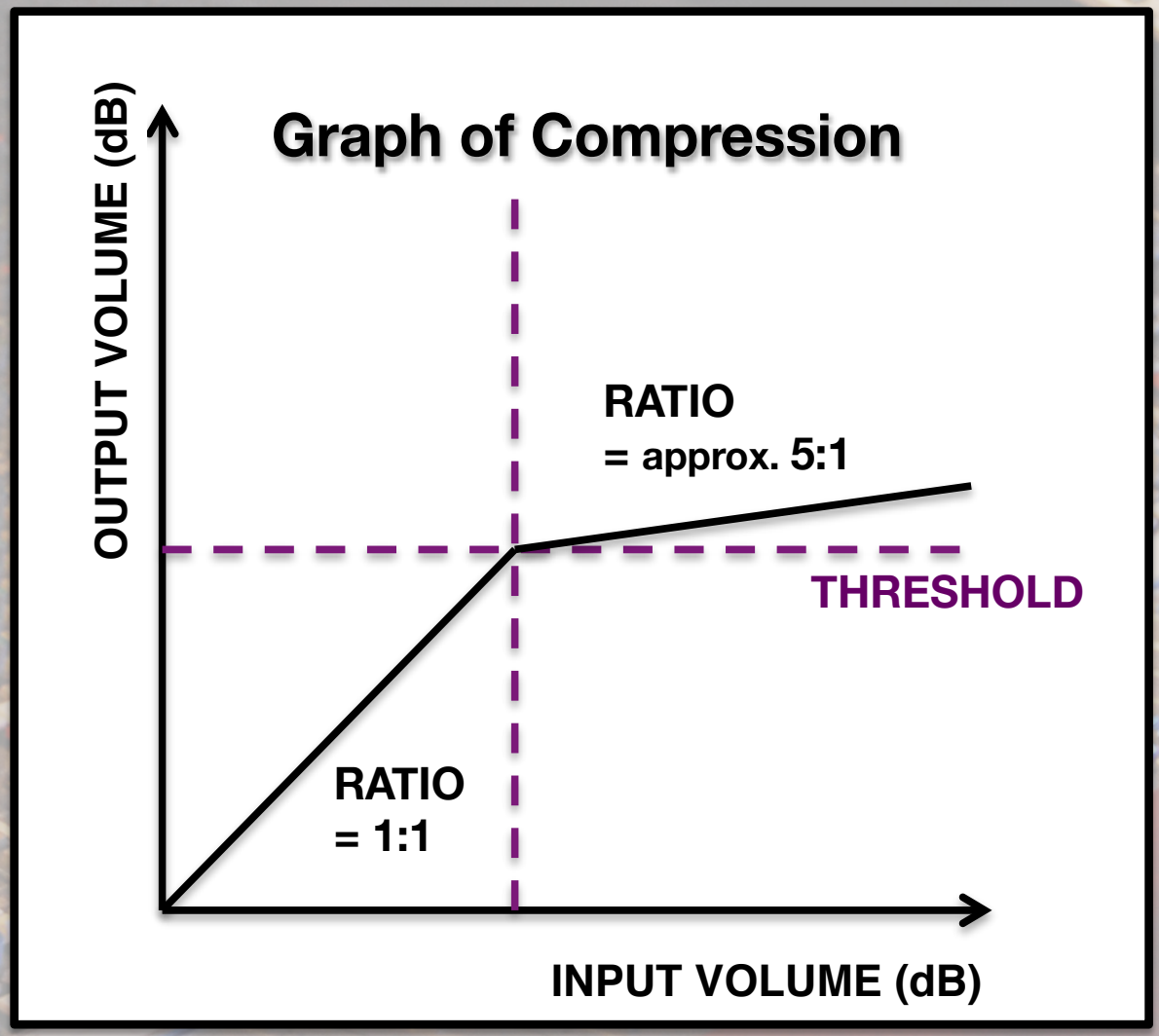
- A compressor **reduces the dynamic range.**
- It is applied by **‘pulling down’ the loud parts** of a track and then **raising the overall volume**
- This makes it **seem consistently louder** and the **average volume will be higher.**

Compression

- The volume **above which** a compressor begins to compress is called the **threshold.**

- The ratio is the **input volume : output volume and how much the compressor will reduce the signal by.**

Compression



4. Dynamic Range Processing

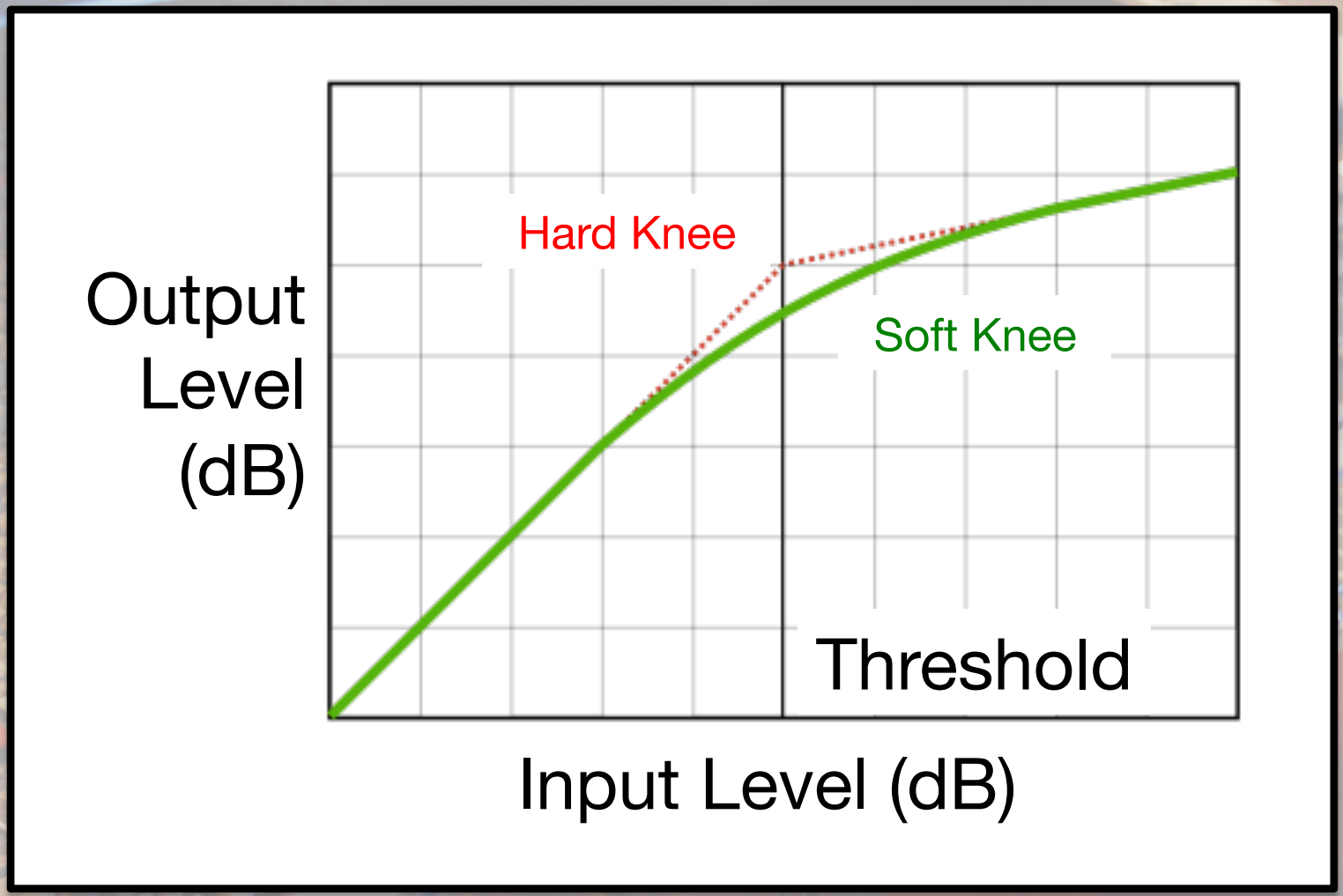
Compression

- **Attack and release** control how quickly the compressor will reduce the volume and allow it to return to normal once it **falls below the threshold again.**

- A **hard knee compressor** applies the compression specified by the ratio instantly at the threshold.

- A soft knee compressor **gradually increases the ratio** slightly before and after the threshold; this **looks more like a curve.**

Hard / Soft Knee



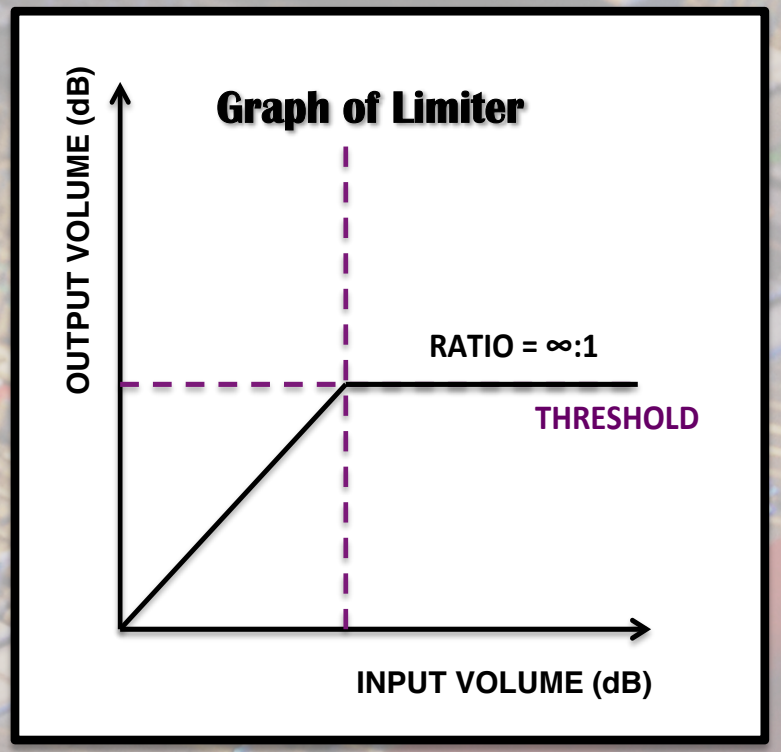
4. Dynamic Range Processing

Compression

- **Multiband compression** allows different parts of the frequency spectrum to be compressed in different ways (avoids pumping).
- **Sidechain compression** is where a compressor is triggered by one track, but the actual compression is applied to another (e.g. causing a pad to ‘duck’ with the kick drum).
- **Deessers** are a form of multiband compression that only compresses mid-high frequencies, reducing the volume of ‘s’ sounds that may be too prevalent

Limiters

- Limiters **will not let the volume of the sound go past 1dB.**
- They can be used to **protect equipment** & are essentially **extreme compressors.**



Noise Gates

- A noise gate **expands the dynamic range.**
- It is applied by **removing all audio** that falls below a certain level, meaning that **background noise can be removed** as long as nothing else is playing at the same time.
- The volume **below which a noise gate silences** audio is known as the **threshold.**

Noise Gates

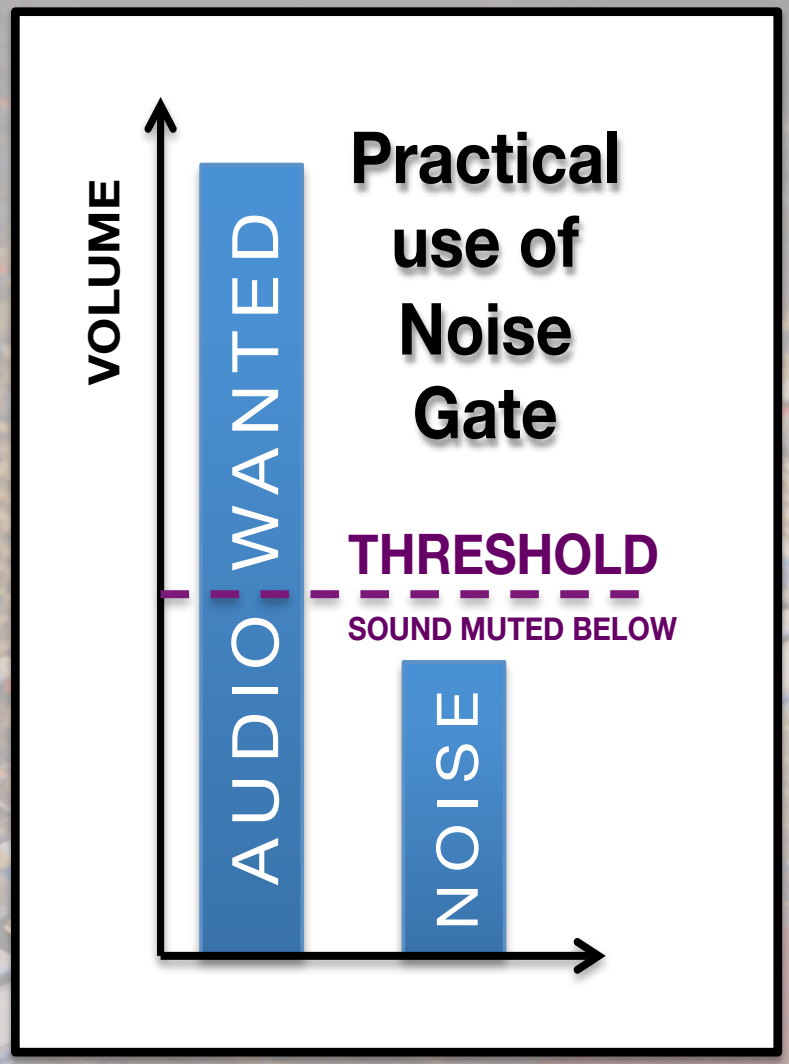
- Like compressors, **gates can also be sidechained,** and this is often used in dance music.

- **Attack, hold** and **release** control how quickly the noise gate opens, how long it will stay open for once a sound **passes the threshold** and how long it takes to close once a sound's volume **falls below the threshold.**

Noise Gates

- **Lookahead** preempts a sound passing the threshold level and ensures the sound's attack is not lost.
- An **expander** expands the dynamic range by reducing the volume of sounds below threshold (does not completely silence).

Noise Gates


VOLUME
AUDIO WANTED
NOISE
Practical use of Noise Gate
THRESHOLD
SOUND MUTED BELOW